



MARINE FOOD SERVICE, LAUNDRY AND WASTE SOLUTIONS



WASTE MANAGEMENT

INTRODUCTION

THIS IS LOIPART

- Specialists in marine food service, laundry and waste solutions.
- Approximately 200 employees.
- Customers in 62 countries.
- A track record of deliveries on more than 12,000 ships.
- More than 40 years of experience.
- Privately owned.
- The highest AAA credit rating.
- Offices in Sweden, USA, Korea, Finland and Singapore.
- Agents and representatives all over the world.

FROM SINGLE UNIT DELIVERY TO TURNKEY SOLUTIONS



INTRODUCTION

Pollution of the marine environment can have both biological and economic impacts. In recognition of the harm that garbage does to the marine environment, the International Maritime Organization (IMO) adopted MARPOL Annex V with the aim of preventing pollution by waste from ships.

Management of ship-generated garbage has become a complex area, both legally and technically.

WASTE MANAGEMENT SYSTEMS

Various types of waste are generated during operation and in order to implement a waste management system, it is necessary to identify and quantify the different types of waste on board.

Management, handling and disposal of ship-generated garbage can be divided into different phases with several options in each phase depending on vessel resources and port reception facilities.

The handling and storing of garbage will vary depending on type of vessel, areas of operation, number of people on board, etc.

Careful planning, with proper processing and garbage disposal options in mind, can ensure compliance with regulations as well as efficient waste management.

A Garbage Management Plan should be prepared early in the design process for new-buildings to

adjust space, equipment and needs accordingly.

HOW CAN WE HELP?

With our technical expertise and experience we can assist clients worldwide with efficient and

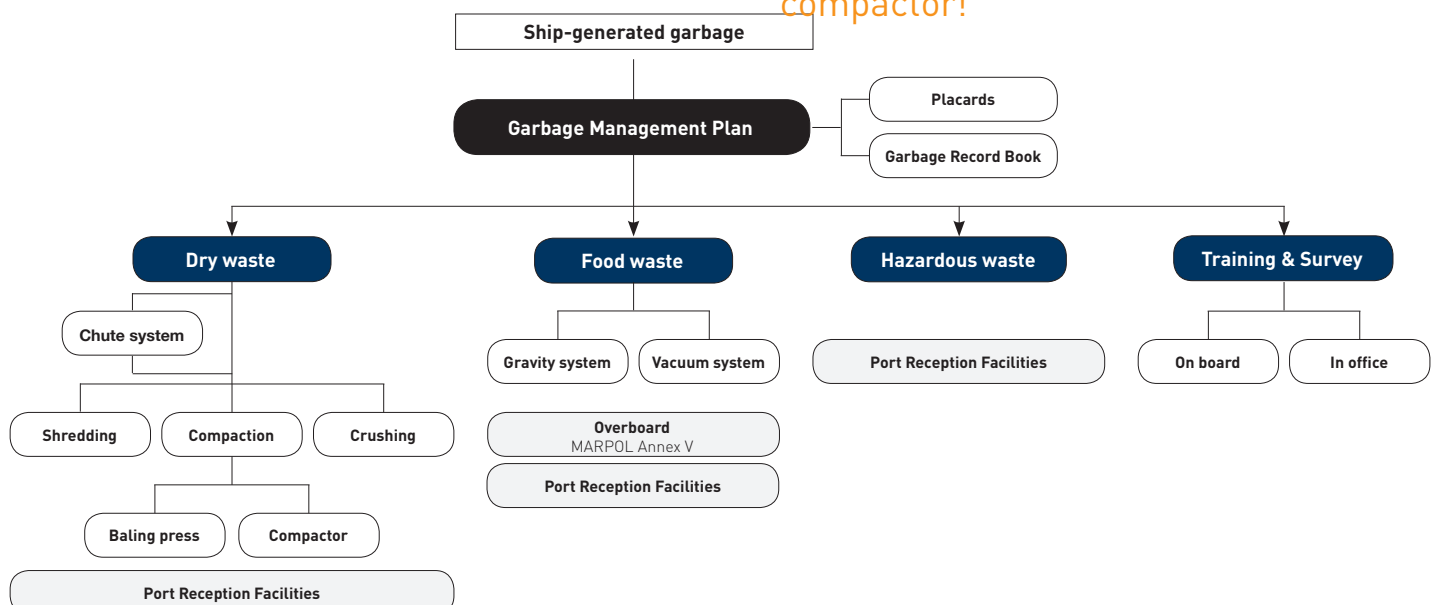
Layout design
On board survey
Review of Garbage Management Plan
Conversions and upgrades
Turn-key deliveries
Spare parts and services

innovative solutions for ship-generated garbage and also improve the environmental performance and strategies on board.

WHY INVEST IN A WASTE MANAGEMENT SYSTEM?

- Reducing costs
- Regulatory compliance
- Corporate Social Responsibilities (CSR)
- Better working conditions for the crew

A waste management system is more than just installing a waste compactor!



REGULATIONS & STANDARDS

MARPOL ANNEX V

Activities related to the management of ship-generated garbage are broadly regulated internationally by MARPOL Annex V. The revised MARPOL Annex V was adopted at MEPC.62 by the resolution MEPC.201(62) and entered into force on January 1st 2013.

REGIONAL AND NATIONAL REQUIREMENTS

The requirements of MARPOL Annex V set the minimum standard for garbage management and more specific requirements may exist in regional or national jurisdictions.

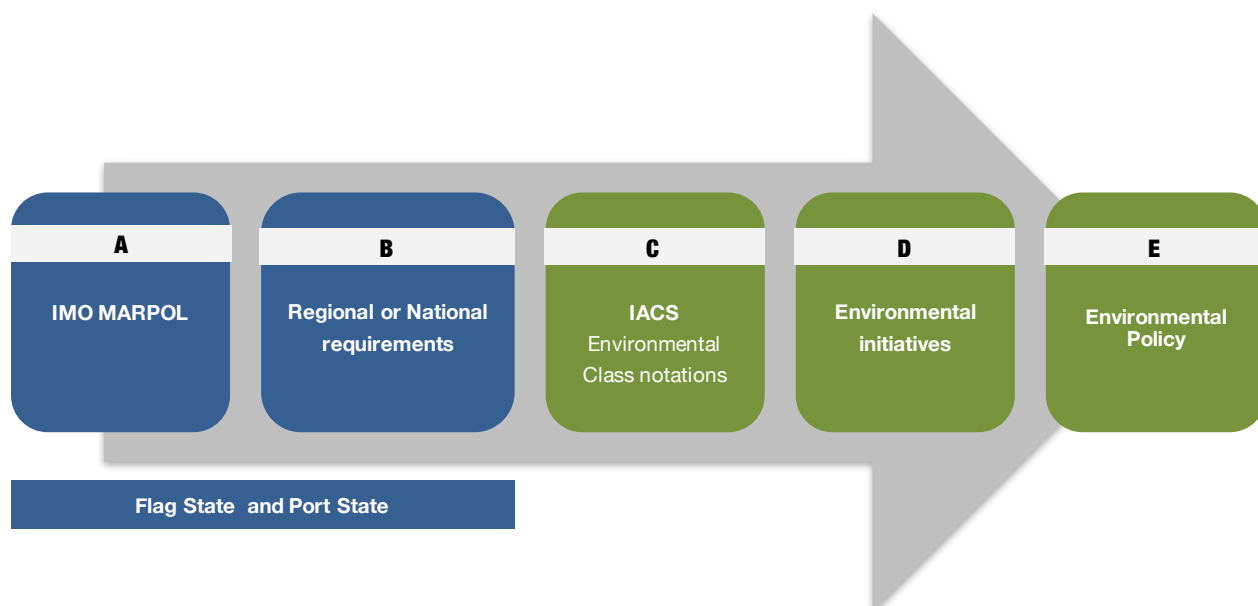
During a Port State Control the inspectors may inspect the Garbage Management Plan, Garbage Record Book and Placards, but also cleanness in the garbage room.

IACS ADDITIONAL CLASS NOTATIONS

All IACS members have developed voluntary environmental class notations where the requirements are in compliance with, or more extensive than, those found in international standards currently in force.

ENVIRONMENTAL INITIATIVES

Sustainability and environmental performance have become important factors for many owners and several voluntary environmental initiatives with scoring systems have been developed, which makes it possible for charterers to select ships and ship owners on the basis of environmental performance.





**Performance beyond
the requirements!**

FOOD WASTE

Food waste is one of the most difficult waste to handle on board as it biodegrades readily and contribute to odour. By treating the fraction where it is produced, in the galley, minimum transport and work for the crew can be achieved as well as proper hygiene in the galley. Historically a simple disposer has been installed under the sink in the galley and no attention has been paid to where the ground food waste has been discharged...

Food waste and food contaminated waste are strictly regulated ashore under health rules concerning 'animal-by-products' and will be subject to quarantine requirements.

- Food waste is a difficult to handle on board.
- Common with clogged pipes for existing installations.
- Quarantine waste which requires special handling in port.

DESCRIPTION GRAVITY SYSTEM



GRAVITY SYSTEM

We have developed a new generation food waste system for smaller vessels which is based on gravity.

The system includes a disposer integrated with a control system and an automatic dosing system for antiscalant chemicals to minimize the risk of blockage in the piping system. The disposer grinds food waste into small pieces and combined with water creates a slurry.

The batch feeding process takes place locally where the disposer station(s) is located and the system is designed for automatic operation. The ground food waste is discharged directly overboard or directed to a holding tank. This means that the system can be in operation even if the vessel is operating within an area where discharge is prohibited.

KEY FEATURES

- Avoid clogged pipes
- Controlled velocity in the piping system
- Wide range of options for water consumption savings
- Simple touchscreen operation panel
- Automatic dosing control for antiscalant chemicals
- For retrofit and new-buildings
- Easy installation!
- Flexible connections for installation on existing units



VACUUM SYSTEM

We have in close co-operation with on board crew members developed a new generation of food waste system. The system utilizes vacuum technology to minimize the risk of blockage in the piping system and is designed for automatic operation and batch feeding.

WORKING PRINCIPLE OF THE SYSTEM

The system is designed for treatment and transportation of food waste in compliance with MARPOL Annex V and other relevant regulations and standards. No other types of waste are allowed to enter the system.

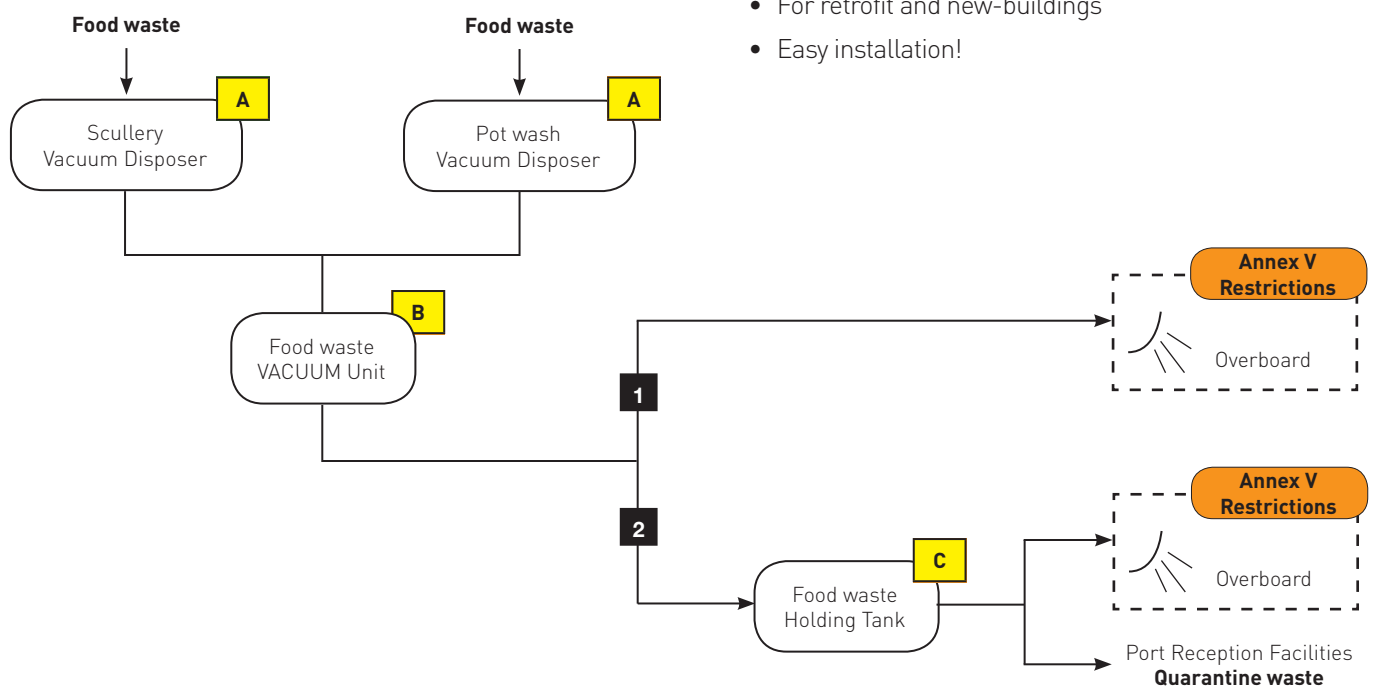
The system has the possibility to isolate and lock the overboard discharge during operation within an area where discharge is prohibited. The ground food waste can then be directed to a holding tank designed for food waste.

FOOD WASTE vs SEWAGE TREATMENT PLANT

Food waste is not defined as sewage or grey water and shall not be discharged into a vessel's sewage treatment plant as it will contribute to increased levels of BOD (Biochemical Oxygen Demand) and the sewage treatment plant might fail to treat the sewage in accordance with IMO requirements.

KEY FEATURES

- Avoid clogged pipes
- High level of efficiency with consistently high vacuum performance
- Vacuum pump with non-contact compression without operating fluid
- Low water consumption
- Small and flexible piping
- Compact system, skid mounted units
- Control system indicates leakage and clogged pipes
- Proven low level of maintenance!
- For retrofit and new-buildings
- Easy installation!



DRY WASTE

As a part of the system for ship-generated waste, processing equipment such as compactors, baling presses, shredders and crushers can be installed on board to optimize storage space and make garbage easier to store and to transfer to port reception facilities.

Garbage collection points with receptacles should be located in appropriate spaces throughout the ship and the garbage should be stored in a manner, which avoids health, safety and environmental hazards.

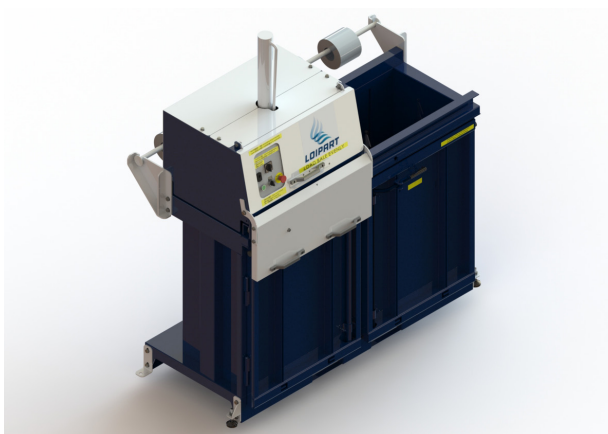
Waste fractions to be recycled at port reception facilities should be separated prior to the on board processing.

In order for a waste management system to be successful, the crew must have an environmental awareness and understand the importance of minimizing generation of and separating the waste.

BALING PRESSES & COMPACTORS

Ship-generated garbage, such as paper, various plastic waste, cardboard and packaging materials, can be compacted and reduce the volume of garbage into bales. When enough material exists in the chamber to form a bale, the baling bands are secured around the material and a bale is produced.

The volume reduction can be up to 80-90% of the original volume, depending on fraction.



Too often a compactor is installed on board without being used...

SHREDDERS

A shredder processes a higher quantity of ship-generated garbage into shredded pieces. It can be used prior to the compactor to increase

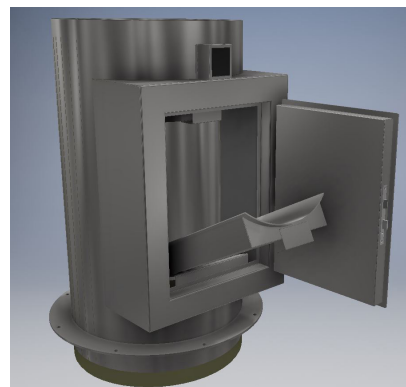


the compaction ratio, but it also works well in combination with an shipboard incinerator. It is not recommend to process food waste in the shredder!

CHUTE SYSTEMS

A chute system is a cost-effective and efficient way for the on board transportation of ship-generated garbage and minimizing the risk for cross contamination.

Our chute systems for general dry waste, glass and tins are designed and manufactured to comply with IMO SOLAS.



CERTIFICATES AND TYPE APPROVALS

It is not possible to type approve equipment related to MARPOL 73/78 Annex V due to the lack of appropriate international and class standards covering these installations.

- Processing equipment for recyclable waste
- Compactor & Baling press
- Shredder
- Crusher

Preventing the production of waste through waste minimization and the re-use of waste materials through recycling.



THE SYSTEM

GARBAGE MANAGEMENT PLAN & PLACARDS

All vessels of ≥ 100 GT, and ships certified to carry 15 persons or more, shall be provided with a Garbage Management Plan which includes written procedures for minimizing, collecting, storing, processing and disposing of garbage, including the use of the processing equipment on board.

The Garbage Management Plan is raised as a tool on board the vessel, in order to help the crew in the daily work with different garbage issues. The Plan should regularly be reviewed to ensure that garbage processing is effectively implemented and also to ensure that garbage processing equipment are maintained in good order at all times.

All vessels of ≥ 400 GT, and ships certified to carry 15 persons or more, shall be provided with a Garbage Record Book.

All vessels of ≥ 12 metres shall display Placards which notify the crew and passengers of the ship's disposal requirements.

TRAINING ACADEMY

Training should be provided for all crew members who are involved in operating the garbage processing equipment, handling and disposing of garbage as part of their operational responsibilities.

Owners, designers and shipyards have different objectives when it comes to environmental management systems and too often there is a missing link between the office and the crew on board.

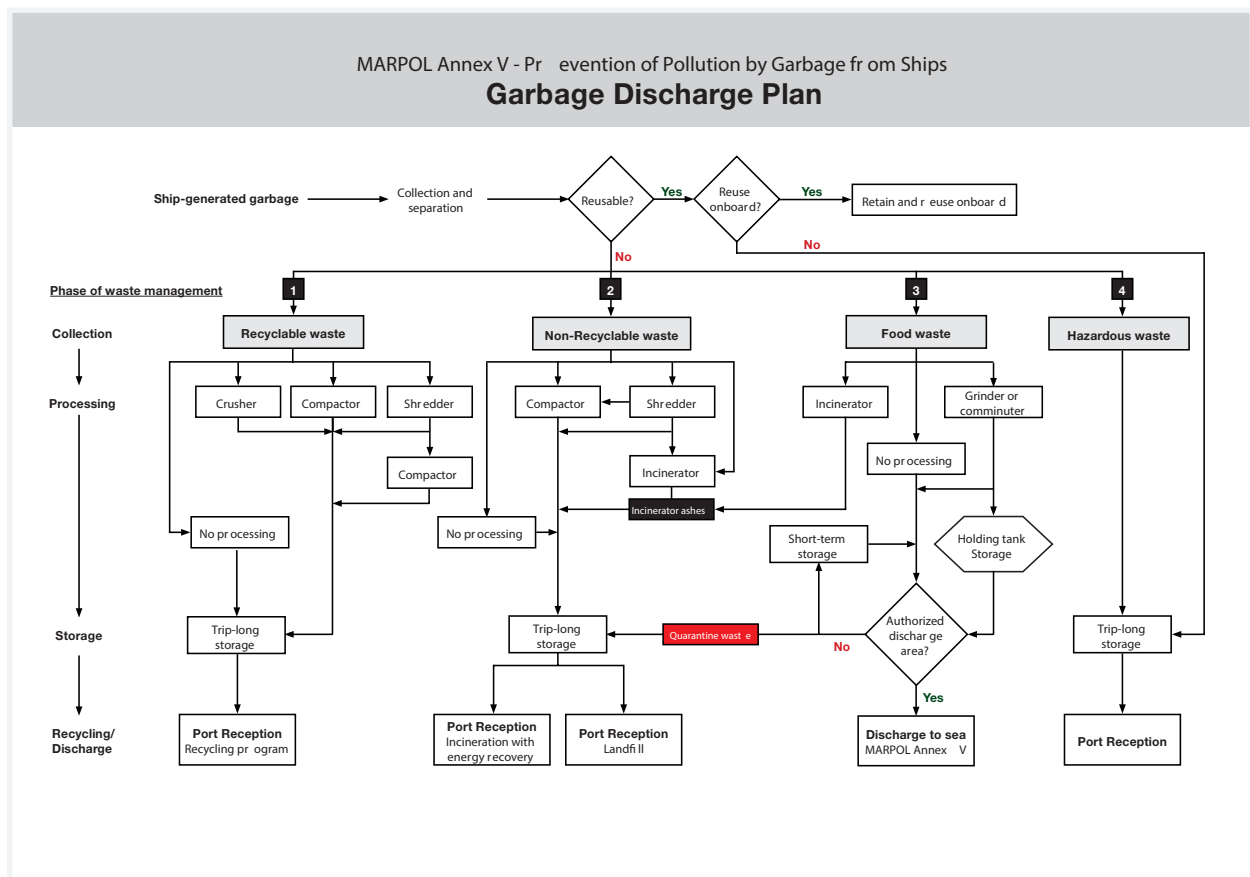
The key to success is training, education and understanding - not only the equipment.

ABOUT US

We have for many years been working with environmental development within the maritime and offshore sector with focus on ship-generated garbage.

In respect of the serious legal and environmental issues related to discharge at sea we can provide cost-effective, compliant solutions and environmental expertise.

Example of a Garbage Disposal Plan



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